# HUMAN RESOURCES FOR TREATING NEW CANCER CASES IN BULGARIA

**Executive Summary**

The purpose of this report is to describe the human resources needed in Bulgaria to treat new cancer patients.

The population of Bulgaria is approximately 7.59 million (3.67 million men and 3.92 million women) and the estimated number of new cancer cases in Bulgaria for the year 2008, based on Globocan data for Bulgaria as a whole (http://globocan.iarc.fr/) was 30701 (16024 in men and 14677 in women) (Table A). The five most common cancers in Bulgaria are (1) colorectal, (2) urological (bladder, kidney, prostate and testis), (3) lung, (4) breast and (5) gynecological (cervix uteri, corpus uteri and ovary).

Table A: The ten most frequently occurring cancers in Bulgaria for men and women based on 2008 Globocan data (http://globocan.iarc.fr/).

| Cancer | Both | Rank | Men | Rank | Women | Rank |
|---|---|---|---|---|---|---|
| **All cancers excl. non-melanoma skin cancer** | 30701 | | 16024 | | 14677 | |
| **Colorectal** | 4625 | 1 | 2591 | 3 | 2034 | 3 |
| **Urological** | 4149 | 2 | 3592 | 1 | 557 | 7 |
| **Lung** | 3996 | 3 | 3341 | 2 | 655 | 6 |
| **Breast** | 3729 | 4 | | | 3729 | 1 |
| **Gynecological** | 3223 | 5 | | | 3223 | 2 |
| **Head and Neck** | 1846 | 6 | 1340 | 4 | 506 | 9 |
| **Stomach** | 1785 | 7 | 1081 | 5 | 704 | 5 |
| **Hematological Malignancies** | 1563 | 8 | 838 | 6 | 725 | 4 |
| **Pancreas** | 1167 | 9 | 656 | 7 | 511 | 8 |
| **Brain, nervous system** | 771 | 10 | 431 | 8 | 340 | 10 |
| **Liver** | 577 | 11 | 378 | 9 | 199 | 12 |
| **Melanoma of skin** | 431 | 12 | 213 | 10 | 218 | 11 |

Newly diagnosed cancer patients need pathology, surgery, chemotherapy and/or radiation therapy. The number of oncologists needed is based, therefore, on the number of patients requiring pathology, surgery, chemotherapy and radiation therapy (Table B). This number is estimated from the percentage of patients requiring surgery, chemotherapy and/or radiation therapy for the top ten cancers in both men and women. For developing countries the International Atomic Energy Agency (IAEA) recommends training Radiation/Clinical Oncologists who can prescribe both radiation and chemotherapy for the common solid cancers, instead of separate medical and radiation oncologists. Hematological malignancies are treated primarily by hematologist-oncologists. The number of specialists needed is based upon the number of cancer patients but each city, in order to ensure coverage if one person leaves or goes on vacation, must have at least 2 surgical oncologists, 2 radiation/clinical oncologists, 2 hematologist oncologists, etc.

Table B: Number of Oncologists needed for Bulgaria's two most populous cities based on 2011 population estimates (http://citypopulation.de/) and 2008 Globocan data for new cancer cases (http://globocan.iarc.fr/).

| | New Cancer Cases | Hematologist Oncologists | Surgical Oncologists | Radiation / Clinical Oncologists | Urologic Oncologists | Gynecologic Oncologists | Neuro-Oncologists | Pathologists |
|---|---|---|---|---|---|---|---|---|
| **Sofija** | **4886** | 2† | 6 | 25 | 2 | 2 | 2† | 10 |
| **Plovdiv** | **1368** | 2† | 2 | 7 | 2† | 2† | 2† | 3 |

†At least 2 are needed in each city.

In addition to Oncologists, support staff such as Pharmacists, Pharmacy Technicians, Oncology Nurses and Palliative Care specialists is also needed. Many cancer patients require hospitalization for diagnosis, treatment and/or complications, therefore an adequate number of oncology beds will be needed. The number of oncology nurses, onco-pharmacists and pharmacy technicians needed is based upon the number of beds occupied daily by cancer patients while the number of palliative care specialists is based on the number of new cancer cases per year (Table C). The oncology nursing staff for each 24-bed oncology unit (operating 24 hours a day, 7 days a week) comprises of one head nurse and a nurse specialist as well as 13 nurses working 8 hour shifts, 5 days per week.

Table C: Number of Oncology Units, Nursing and Pharmacy Staff needed for Bulgaria's two most populous cities based on 2011 population estimates (http://citypopulation.de/) and 2008 Globocan data for new cancer cases (http://globocan.iarc.fr/).

| | New Cancer Cases | Oncology Beds/Day | 24 bed Oncology Wards | Onco-Pharmacists | Pharmacy Technicians | Palliative Care Specialists | Oncology Ward Nurses |
|---|---|---|---|---|---|---|---|
| **Sofija** | **4886** | 94 | 4 | 16 | 24 | 10 | 60 |
| **Plovdiv** | **1368** | 27 | 2 | 8 | 12 | 3 | 30 |

Since many cancer patients require radiotherapy, appropriately equipped facilities will be needed along with radiation oncology staff (Tables D and E). Radiation oncology staff includes radiation therapy technicians, medical physicists, Linac engineers and radiation oncology nurses in addition to radiation/clinical oncologists. The minimum radiation therapy equipment requirements are at least one of each: Linac, brachytherapy unit, CT simulator, treatment planning computer and dosimetry/quality assurance package.

Table D: Radiation Therapy Staff needed for Bulgaria's two most populous cities based on 2011 population estimates (http://citypopulation.de/) and 2008 Globocan data for new cancer cases (http://globocan.iarc.fr/).

| | New Cancer Cases | Radiation / Clinical Oncologists | Radiation Therapy Technicians | Medical Physicists | Linac Engineers | Radiation Oncology Nurses |
|---|---|---|---|---|---|---|
| **Sofija** | **4886** | 25 | 36 | 12 | 3 | 12 |
| **Plovdiv** | **1368** | 7 | 10 | 4 | 2† | 4 |

†At least 2 are needed in each city.

Table E: Radiation Therapy Equipment needed for Bulgaria's two most populous cities based on 2011 population estimates (http://citypopulation.de/) and 2008 Globocan data for new cancer cases (http://globocan.iarc.fr/).

| | New Cancer Cases | Linac / Co ( Megavolt U | Brachytherapy Units | CT Simulators | Treatment Planning Computers | Dosimetry /QA Packages |
|---|---|---|---|---|---|---|
| **Sofija** | **4886** | 6 | 3 | 3 | 3 | 3 |
| **Plovdiv** | **1368** | 2 | 1 | 1 | 1 | 1 |

**NOTE:** Guidelines from the IAEA of the United Nations were used to calculate the radiation therapy equipment and staff needed in the setting of a developing country. Guidelines from the Oncology Nursing Society were used to calculate the number of nurses needed. Several other specialty societies were also requested to provide guidelines but in most cases there were none, therefore colleagues active in those fields were consulted for estimating the number of staff needed.